Test Procedure for Mating 2.5mm Bayonet Connectors to Single-Channel Active Fiber-Optic Modules, Light Sources, and Photodetectors

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ABSTRACT: This document describes the method for testing the active device mount (ADM) of fiber-optic active components—modules, light sources, and photodetectors – with 2.5 mm bayonet connectors for wear out and coupled signal attenuation.

APPLICABILITY: This test procedure is required for Digital personnel or external suppliers responsible for the evaluation and qualification of fiber-optic active components.

STATUS: APPROVED 23-May-1990; use VTX SMC for current status.

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APPROVAL: This document has been reviewed and approved by T&NM.

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1 OBJECTIVE

This procedure describes the method for testing the active device mount (ADM) of fiber-optic active components with 2.5 mm bayonet connectors for wear out and coupled signal attenuation.

2 TEST APPARATUS

Test apparatus includes:

- Three single channel cable assemblies for each ferrule material listed below (a total of 15 cables). The connector shall conform to Digital specification A-PS-1224893-0-0. The cable assembly shall be 4.5 meters long, per Digital specification A-PS-1702533-0-0.

  NOTE

  This is a two-channel cable assembly.

  Ferrule materials:

  Ceramic Alumina
  Ceramic Zirconia
  Stainless Steel
  Glass capillary/liquid crystal polymer
  Thermoplastic

  NOTE

  Refer to Digital's Qualified Vendor List for approved suppliers and styles.

- Three fiber-optic components for each ferrule material to be tested (a total of 15 components).
- Measurement equipment capable of measuring *average* coupled launch power for transmitter modules and light sources, sensitivity for receiver modules, or responsivity for photodetectors.

3 TEST SETUP

The cable will not be mode stripped. It must lay flat and unwound.

This is a relative measurement test having as a reference the initial reading (*average* coupled launch power, sensitivity, or responsivity depending on the component being tested) for *each* test as shown in the test matrix below under heading 4.

The components being tested shall be securely mounted and shall not move during insertion/withdrawal test cycles.

Three connectors of the same ferrule material shall be tested with three components. Test requirements are as follows.

- Only one connector per (single channel) cable assembly will always mate with the components. The second connector in the same (single channel) cable assembly will be used to connect with the measurement equipment.
- Each component will undergo a total of 150 insertion/withdrawal cycles.
- This test sequence/setup shall be repeated for every different connector ferrule material tested.
- Tests are to be performed at room temperature.

4 TEST MATRIX FOR EACH FERRULE MATERIAL

The following matrix summarizes the test sequence required for this test procedure. This matrix has been set up to simulate various levels of intermateability between all connectors and all components tested (that is, new component with new connector, new component with used connector, used component with new connector, and used component with used connector).

Total Number of Insertions/Withdrawals

Component	Connectors A	B	C	Total
1	60 →	40 →	50	150
2	50 →	60 →	40	150
3	40 →	50 →	60	150
			Cumulative Total	450

→ Indicates test sequence direction

5 TEST PROCEDURE

The connector/component mating test procedure is as follows.

1. Ensure that all components and connectors are clean before starting the test.
2. Label components 1, 2, and 3, and label one connector per single-channel cable assembly A, B, and C.
3. Connect component 1 with connector A and record initial reading. Maximum insertion force shall be 3.0 pounds.
4. Complete 10 insertion/withdrawal cycles between component 1 and connector A and record a reading after the tenth cycle. DO NOT CLEAN THE COMPONENT OR THE CONNECTOR.
5. Repeat step 4 recording a reading after every tenth cycle until completing 60 total cycles.
6. Stop testing on any given combination once a differential reading larger than 0.7 dB is obtained. If cleaning brings back the readings within 0.7 dB from the initial reading, continue testing combination(s) and note that cleaning was performed.
7. After taking the last cycle reading, disconnect connector A, clean connector ferrule with alcohol and a cotton swab (talcum free), reconnect connector A, and record a reading.
8. Disconnect connector A.
9. Connect component 1 with connector B and repeat steps 3 through 8 until completing 40 total cycles.
10. Repeat step 9 with component 1/connector C, component 2/connector A, component 2/connector B, and so forth, up to component 3/connector C, completing the total number of cycles indicated in the test matrix for each component/connector combination.
11. Repeat steps 1 through 10 for each new set of connector ferrule material and components.

6 FAILURE CRITERIA

The component is considered to fail the test when, after cleaning the connector ferrule, the reading cannot be brought back within 0.7 dB from the initial reading or if the connector requires cleaning more than once in less than 10 consecutive insertions/withdrawals.

Connector ferrule jamming, breakage or damage to the component housing (such as breaking the component lock posts) also constitutes a failure. Binding does not constitute a failure.

The maximum allowed differential reading is 0.7 dB.

The maximum insertion/withdrawal force shall not exceed 3.0 pounds.

APPENDIX A RELATED DOCUMENTS

The following documents, per latest revision, are applicable to EL-MF716-01.

- A-PS-1224893-0-0, *Connector, 2.5 mm Bayonet Style, Fiber Optic, Male*
- A-PS-1702533-0-0, *Cable Assembly, 2.5 mm Bayonet Connectors with a 62.5/125 Micron, Fiber Optic, 2 Channel, Dual Wavelength Cable*